

ABSTRACT

An electromagnetic actuator is provided that comprises a housing, a solenoid coil, and an armature. The armature can move between a first position proximate a portion of the housing and a second position distal of the portion of the housing. The armature and the portion of the housing define a first gap and an extension member extends in an axial direction into the first gap, thereby defining a second gap. The width of the second gap is less than the width of the first gap. The length and shape of the extension member may be varied to produce increased initial magnetic force from the solenoid coil on the armature. The length and shape of the extension member may also be varied to produce a desired armature force-displacement curve over the stroke of the actuator.